



## Environmental Assessment for the Restoration of La Madre, Rainbow, and Kiup Springs

Prepared for

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## **2 1.0 Introduction**

### **2.1 1.1 Identifying Information**

#### **2.1.1 1.1.1 Title, EA Number, and Type of Project**

Environmental Assessment for the Restoration of La Madre, Rainbow, and Kiup Springs

DOI-BLM-NV-S010-2013-0044-EA

Restoration

#### **2.1.2 1.1.2 Location of Proposed Action**

The proposed action would occur at La Madre, Rainbow, and Kiup springs on Bureau of Land Management-managed lands (Red Rock Canyon National Conservation Area and Trout Canyon) within the Southern Nevada District Office (Figure 1-1).

La Madre Spring: 614579 4002868 UTM; Township 21S, Range 58E, Section 29

Rainbow Spring: 634318 4005180 UTM; Township 22S, Range 58E, Section 8

Kiup Spring: 634245 3990858 UTM; Township 20S, Range 56E, Section 31

#### **2.1.3 1.1.3 Name and Location of Preparing Office**

Bureau of Land Management, Southern Nevada District Office

4701 North Torrey Pines Drive

Las Vegas, Nevada 89130

#### **2.1.4 1.1.4 Applicant Name**

Bureau of Land Management (BLM)

### **2.2 1.2 Purpose and Need for Action**

The hydrologic function of La Madre, and Rainbow, and Kiup springs has been significantly altered by past human disturbance and invasive native and non-native plant species. La Madre Spring, in La Madre Mountain Wilderness, is infested with *Arundo donax*, an exotic invasive cane. The human-made dam at the spring has altered hydrologic conditions. Rainbow Spring, in Rainbow Mountain Wilderness, was heavily grazed in the past and is now covered in a monoculture of native sedges and rushes.

Figure 1-1, 8.5x11"

Off-highway vehicle (OHV) use also affects this spring; there is a road that leads directly to it from a nearby community. As a result of past heavy grazing and human activities, Kiup Spring is now covered in a monoculture of native sedges and rushes.

La Madre Spring supports a small population of the BLM-sensitive southeast Nevada springsnail (*Pyrgulopsis turbatrrix*), and is 1 of the approximately 10 known locations for this species. The Spring Mountains springsnail (*Pyrgulopsis deaconi*) was observed as scarce at Rainbow Spring by Sada (2002), but has since not been found at that location. Kiup spring currently supports a small population of the BLM-sensitive Spring Mountains springsnail.

The need for the proposed action is to restore the proper functioning condition of the springs. The purpose for La Madre, and Rainbow, and Kiup Springs Restoration Plan is to re-establish and/or improve habitat for springsnails, increase native plant diversity, manage non-native invasive species, and provide site protection.

### **2.3 1.3 Scoping, Public Involvement, and Issues**

Internal and external scoping were performed. Internal scoping by BLM resource specialists identified the following potential issues: noxious weeds and invasive non-native species, impacts to riparian areas and wetlands, impacts to migratory birds, impacts to wilderness character, human health and safety risks, potential for localized soil erosion, visual resources, impacts to BLM sensitive species, hydrological conditions of the local perched aquifers, and impacts to surface water resources. These issues are addressed in this environmental assessment.

The BLM Southern Nevada District Office sought public input on plans to restore springs in Red Rock Canyon National Conservation Area and Trout Canyon during two open house presentations on Thursday, January 17, 2013, at the Red Rock Canyon National Conservation Area Visitor Center. The BLM also mailed a Notice of Proposed Action to individuals and organizations that have expressed an interest in recreation/wilderness-related actions. Those who received the Notice of Proposed Action had 30 days to provide comments on the proposed action. The public submitted comments related to biological resources, cultural resources, water resources, and La Madre Spring. These comments have been summarized in a scoping report, attached as Appendix A.

### **2.4 1.4 Relationship to Laws, Regulations, Policies, and Other Plans**

This environmental assessment has been prepared in accordance with the following statutes and implementing regulations, policies, and procedures:

- National Environmental Policy Act (NEPA) of 1969, as amended (Public Law 91–190, 42 United States Code 4321 et seq.);
- 40 Code of Federal Regulations (CFR) 1500 et seq: Regulations for Implementing the Procedural Provisions of NEPA;
- 43 CFR Part 46: Department of the Interior’s Regulations for Implementation of NEPA and Council on Environmental Quality Regulations;

- BLM NEPA Handbook (H-1790-1; BLM 2008);
- Federal Land Policy and Management Act of 1976, as amended, Sections 103(c), 501(a)(4), and 503;
- BLM Las Vegas Resource Management Plan and Record of Decision (1998); and
- Red Rock Canyon National Conservation Area Resource Management Plan and Record of Decision (2005).

The BLM land uses in southern Nevada are managed under the 1998 Las Vegas Resource Management Plan (RMP). The Las Vegas RMP provides management objectives and directions for lands within the Southern Nevada District of the BLM. The BLM manages approximately 2.5 million acres of public land in Clark County, Nevada.

The proposed action has been analyzed within the scope of the following statutes, regulations, and policy and has been found to be in compliance:

- Wilderness Act of 1964
- 43 CFR 6300 (Wilderness Management)
- BLM Manual 8560, H-8560–1, 8561 (Wilderness Management)
- BLM Manual 6840 (Special Status Species Management)

## 3 2.0 Proposed Action and Alternatives

### 3.1 2.1 Description of the Proposed Action

The BLM Southern Nevada District Office proposes to restore natural conditions at three springs in the Spring Mountains to restore habitat for two BLM-sensitive springsnails (*Pyrgulopsis turbatrix* and *P. deaconi*).

The proposed restoration plan for La Madre, and Rainbow, and Kiup springs is summarized below and provided as Appendix B.

#### 3.1.1 2.1.1 Restoration Areas

All three spring restoration sites are in remote areas, and two (La Madre and Rainbow) are within wilderness, where motorized travel is not permitted. A minimum tools analysis has been conducted for proposed restoration activities at La Madre and Rainbow springs. Work areas at each spring would be flagged and/or staked by the field supervisor and approved by the BLM project manager prior to beginning work. No work would occur outside of the approved staked areas.

#### La Madre Spring

La Madre Spring is within the Red Rock Canyon National Conservation Area and the La Madre Mountain Wilderness. La Madre Spring is accessible from Scenic Loop Drive by driving a dirt road that extends northward from the Willow Springs picnic area and then hiking into the wilderness an additional mile (Figure 2-1). The spring currently supports a small population of springsnails (*Pyrgulopsis turbatrix*). Primary restoration activities proposed for La Madre Spring would include the following:

- removing the La Madre Dam
- removing invasive giant reed (*Arundo donax*)
- installing native plants

La Madre Spring is the largest site included in this proposed restoration project; its low discharge provides a shallow stream for a relatively long distance.

Figure 2-1, 8.5x11"

### **Rainbow Spring**

Rainbow Spring is within the Rainbow Mountain Wilderness Area and is accessible by Forest Road 537F off Lovell Canyon Road (Figure 2-2). The spring does not currently support occupied springsnail habitat. All proposed restoration activities at Rainbow Spring would be closely monitored by BLM cultural resources staff, because the spring is within an area of cultural resource sensitivity. Primary restoration activities proposed for Rainbow Spring would include the following:

- removing native sedge and grass biomass
- installing natural materials and/or geotextiles to suppress native vegetation in some areas
- creating shallow pools for springsnail habitat
- installing fencing and vertical mulch to protect the site from unauthorized off-highway vehicle use and to encourage habitual recreational pedestrian traffic to cross downstream of riparian vegetation area if possible

Rainbow Spring has the highest discharge and is the deepest of all three springs included in this proposed restoration project.

### **Kiup Spring**

Kiup Spring is east of Pahrump and is accessible by Forest Road 45550A off Trout Canyon Road (Figure 2-3). Kiup Spring is not within designated wilderness. The spring currently supports a small population of springsnails (*Pyrgulopsis deaconi*). Primary restoration activities proposed for Kiup Spring would include removing native sedge and grass biomass, placement of natural materials or geotextiles to suppress vegetation, as well as creating shallow pools to improve springsnail habitat. Because the spring is within an area of cultural resource sensitivity, all proposed restoration activities would be monitored by and coordinated with BLM cultural resources staff. Kiup Spring is the shallowest and shortest of the springs included in the proposed restoration project.

Figure 2-2, 8.5x11"

Figure 2-3, 8.5x11"



### 3.1.2 2.1.2 Site Preparation: Vegetation Removal

#### La Madre Spring: Non-native Species

At La Madre Spring, approximately 0.25 acre of the contiguous patch of giant reed immediately upstream and downstream of the reservoir would be removed and treated with BLM-approved herbicide according to the methods described in the restoration plan (see Appendix B).

Temporary sediment controls would be used (e.g., straw wattles) to reduce litter to and turbidity of downstream resources, including springsnails. Resulting thatch and stumps would be removed from the site in a manner consistent with the minimum tools analysis and disposed of at a proper facility. Green waste would be recycled at the A-1 Organics facility in Las Vegas.

Other non-native species may be encountered and treated or removed at the three restoration sites, including saltcedar (*Tamarix ramosissima*) and Bermuda grass (*Cynodon dactylon*), among others. See Appendix B for treatment methods.

#### Rainbow Springs and Kiup: Native and Non-native Species

A major component of the proposed work at Rainbow and Kiup springs would include removing native plant species (approximately 1 acre and 1.5 acres, respectively) to open the vegetation canopy and reduce vegetation encroachment into springsnail habitat. Native grasses, sedges, and rushes would be dethatched to the ground with gas-powered line trimmers with metal blades. Plant roots would remain intact to protect cultural resources. Other non-native species may be encountered and treated/removed at the three restoration sites, including saltcedar and Bermuda grass. Additional non-native invasive species may be encountered and would be treated according to BLM direction (see Appendix B for treatment details).

Field personnel would form a line parallel to the water flow and work in transects to limit unnecessary trampling and disturbance of the moist soil and flowing water at the springs. Weed-free straw wattles would be placed at the downstream edge of work to reduce litter and turbidity of downstream resources. Work would begin within channel flow areas and move outward so that if sensitive cultural resources were located, work would be restricted to the minimum area necessary for restoration activities. Resulting thatch would be bagged, removed from the site, and disposed of at a proper facility. Green waste would be recycled at the A-1 Organics facility in Las Vegas.

### 3.1.3 2.1.3 Restoration Zones

#### La Madre Spring

The dam at La Madre Spring is 3 to 4 feet high and approximately 30 feet long. The dam would be dismantled with hand tools and removed from the project site consistent with the minimum tools analysis. The dam would be breached in a manner to allow the slow and careful release of water from behind the dam to protect downstream resources, including springsnails. The process of removing the dam and beginning restoration at La Madre Spring would include the following activities:

- Temporary straw wattles would be installed downstream of the dam to intercept litter and reduce water turbidity once work begins.
- A wide, flexible hose would be used to temporarily divert as much of the water as possible from the spring to the streambed downstream of the dam.
- Another hose would be used to siphon water from behind the dam to the streambed downstream of the dam.
- The dam would be removed with sledgehammers, rock chisels, and pry bars. No mechanized tools or equipment would be used.
- Debris would be placed in a stockpile off the trail in a nearby location that would not damage native plants. The stockpile would be placed in an area that provides easy access for pack animals to receive the material for transport off-site via the trail between the spring and Rocky Gap Road.
- Pack animals will be fed weed-free hay.
- Invasive species would be removed from the reservoir area while it is dry.
- Native tree species (especially willow [*Salix* spp.]) and understory plants would be installed in the areas left barren by the removal of giant reed.
- The diversion hose would be removed and water flow restored.
- Sediment control logs would remain in place until all giant reed has been removed from the project area and native plant installation is complete.

### **Rainbow and Kiup Springs**

Rainbow and Kiup springs would be divided into three zones to organize the restoration activities and protect cultural resources. BLM cultural resources personnel would be on-site during work at these locations to ensure that cultural resources would remain protected. Restoration zones would be located and marked after completion of the native vegetation removal as described above.

*Zone A: Active Spring and Channel.* Zone A is the only area where excavation and subsurface disturbance would be allowed. As many as five rock-lined springsnail pools would be excavated in areas that would have water flowing through them. Pools would be 2 to 3 feet wide and less than 6 inches deep. Rocks chosen to line the pools would be gathered on-site and be 1–3 inches in diameter. Native aquatic plants would be installed at the edges of the pools for springsnail forage.

*Zone B: Transition Area.* The transition area boundary for Zone B would extend to 3 feet outside of the Zone A edge. Native marsh understory vegetation in Zone B would be thinned to provide an open buffer area between denser marsh habitat and open springsnail habitat. Excavation and soil disturbance would not be allowed in this zone. Geotextile material would be selectively applied in Zone B to discourage vegetative growth. Natural rock materials would be gathered from the downstream spring channel and placed on the geotextile for a more natural appearance. If adequate rock materials are not available on-site, alternative nearby sites (outside of wilderness) would be chosen for material export (subject to the BLM approval).

Riparian trees, such as velvet ash (*Fraxinus velutina*), may be planted in this zone at low density to enhance the vegetation diversity.

*Zone C: Natural Marsh Vegetation.* The boundary of Zone C would be determined in coordination with BLM cultural resources personnel. Soil disturbance would be limited to excavation of planting holes. The location of plant materials in Zone C would be determined in the field in coordination with BLM cultural resources personnel. Plants would be installed to increase vegetation diversity and would likely include riparian trees such as velvet ash and willows as well as native understory plantings.

#### **3.1.4 2.1.4 Native Plant Material Installation**

Native plants would be installed in areas where the giant reed or other invasive species have been removed (see Appendix B). A permit for collection of plant materials would be obtained from the BLM Southern Nevada District Office. All plant materials procured for the restoration activities would originate from within or as close to the spring sites as possible. Native plant material installation may need to be phased to allow for the time required for collection and propagation. Field personnel would use container plants, transplants, and seeds in the planting of native species. Container plants and transplants would require digging a hole approximately the same depth and twice the width of the plant root ball. Plants would be spaced in a natural setting with variations in planting patterns to blend into the environment.

Native plant seeds would be collected locally to increase survival rates. Seeding in the restoration areas would occur after all weed eradication has been completed and container plants have been installed. Spreading seeds would involve opportunistic raking and hand-broadcasting. A list of potential species for use at the restoration sites is provided in Table 4 of Appendix B.

#### **3.1.5 2.1.5 Site Protection**

Approximately 0.25 mile of fencing would be installed at the Rainbow Mountain Wilderness boundary to protect Rainbow Spring from vehicle trespass and allow bighorn sheep (*Ovis canadensis*) passage. The fence location would be determined by BLM and would conform to BLM standards for wildlife fencing:

- 6-foot t-posts will be spaced 10 feet part, measured on center, maximum 30-inches tall
- Smooth wire (no barbs) will be used for a 3-strand fence spaced from bottom up at 4 inches, 15 inches, and 20 inches.

In addition, newly installed plants may need protection from rabbits and other herbivores. Newly planted nursery stock is of high forage value to wildlife, as it is often rich in water and nutrients. This can result in excessive mortality, when new plantings have not yet established root systems capable of surviving intense herbivory. Temporary wire cages may be installed around all newly planted container stock to discourage damage from herbivory.

### **3.1.6 2.1.6 Maintenance**

A one-year maintenance program would be implemented to ensure the success of the restoration planting and to allow native plants to establish and become self-sustaining. Maintenance would be needed to create and maintain conditions favorable to establishing and fostering growth of native plants. The maintenance program would ensure that native species are allowed to recruit, container plants are becoming established, and weeds are under control.

Invasive non-native species control would be an integral part of the one-year maintenance program. Invasive non-natives would be controlled according to the methodologies described in the proposed restoration plan. A glyphosate-based herbicide (approved for use in wetlands) would be applied in most cases, but selective herbicides may also be applied to control specific types of invasive non-natives, as directed by the habitat restoration specialist in coordination with the BLM. Emphasis would be on keeping invasive non-native species from producing seeds and controlling competition during establishment of the restoration plantings.

### **3.1.7 2.1.7 Special Considerations**

#### **3.1.7.1 2.1.7.1 Personnel Training**

All field personnel would be trained to understand the special considerations that are involved in working in these environmentally sensitive restoration areas, including the sensitive natural and cultural resources that may be encountered, as well as specific rules that must be followed while working. A field supervisor would be present at all times to ensure that work is performed appropriately and that natural and cultural resources are protected.

#### **3.1.7.2 2.1.7.2 Springsnails**

All three springs included in this proposed restoration project support historic habitat for the southeast Nevada springsnail and the Spring Mountains springsnail—both BLM sensitive species that were first described just 15 years ago (Hershler 1998). La Madre and Kiup springs continue to provide habitat for one species each, but recent surveys have not resulted in observations of springsnails at Rainbow Spring. Springsnails tend to occupy areas of slow moving water over sand, gravel, cobble, or aquatic vegetation. Springsnails require good water quality and are highly sensitive to environmental change, including siltation, diversion, or impoundment of water. Many springsnails can survive only in their home spring, which makes them difficult to relocate or reintroduce. The following practices would be implemented to protect springsnails:

- Weed-free straw wattles will be placed in streams to protect downstream springsnails from increased turbidity and/or detritus that is likely to result from removal of vegetative material.
- Protocols to prevent inter-wetland translocation of foreign materials, as described in Sada (2009) will be followed. Personnel will wear rubber boots when in water. After use, boots and tools will be rinsed in water from the stream to remove mud and other materials. They will then be washed in a 10 percent chlorine bleach solution and dried prior to use at another spring location. If shoes do not get wet, dry dirt and other materials will be removed with a brush prior to leaving the site.

- Vegetation that is removed will be immediately checked for presence of springsnails prior to removal from the site. Springsnails will be returned to a safe location.

#### **3.1.7.3 2.1.7.3 Desert Tortoise**

The desert tortoise (*Gopherus agassizii*) is listed as threatened under the Endangered Species Act of 1973, as amended. Desert tortoises are not expected to be present at La Madre Spring; however, the roads to Rainbow and Kiup springs are within desert tortoise habitat. The following practices would be implemented to protect the desert tortoise:

- Personnel will be informed about the legal protection of the desert tortoise and consequences of violating the Endangered Species Act.
- While working at Kiup Spring, the undercarriage of all vehicles will be inspected prior to operation.
- Vehicles will not be driven at excessive speeds.
- If a desert tortoise is encountered, all activity shall cease until the animal has left the area of its own accord.
- Any desert tortoise observation will be reported directly to the BLM Project Manager.

#### **3.1.7.4 2.1.7.4 Cultural Resources**

Cultural resources may be present in the restoration areas. The following practices would be implemented to protect cultural resources:

- All work will be confined to the restoration areas approved by BLM in the restoration plan, and ground disturbance will be limited to the least amount possible to achieve project goals.
- The BLM will provide a cultural resources monitor to be on-site during restoration activities to ensure that cultural resources are protected.
- Collection of cultural objects is strictly prohibited.
- If cultural resources are encountered, work in the immediate area will stop and the BLM will be notified.

#### **3.1.7.5 2.1.7.5 Non-native Invasive Species**

The following practices would be implemented to reduce the spread of invasive species in the project areas:

- Plant materials and erosion control materials will be weed free.
- Equipment and tools will be clean and free of weed propagules upon arrival and departure. Section 1.2.2 of Appendix B contains the tool-washing protocols.
- Equipment will only be used in areas that are free of weeds or that have been treated beforehand.
- Staging will occur only in designated areas that are free of weeds.
- Equipment (including hand tools) and personnel clothing will be inspected for weed seeds and plant parts.
- Weed seeds and plant parts will be bagged and hauled off-site for disposal in a local landfill (unless they have been treated and are not viable).

- Pack animals will be fed weed-free hay.

### 3.1.7.6 2.1.7.6 *Working within Wilderness*

La Madre Spring is within the La Madre Mountain Wilderness, and Rainbow Spring is within the Rainbow Mountain Wilderness. Wilderness is established to protect natural untrammeled and undeveloped qualities of large areas and providing outstanding opportunities for solitude or a primitive and unconfined type of recreation. The Wilderness Act of 1964 prohibits a variety of activities in wilderness, including permanent and temporary roads and the use of motorized vehicles and equipment.

To ensure that these qualities of wilderness are maintained throughout this restoration project, a minimum tools analysis has been completed for proposed work at La Madre and Rainbow springs (see Appendix B, Attachment A). The results of this analysis determined that the methods proposed within the restoration plan are necessary and do not negatively impact the qualities of wilderness.

### 3.1.8 2.1.8 *Schedule*

The proposed project schedule in Table 2-1 below would be adapted to accommodate natural circumstances (such as flooding or inclement weather) that could affect the ability to effectively implement the proposed restoration plan.

**TABLE 2-1  
PROPOSED PROJECT SCHEDULE**

Task	La Madre Spring	Rainbow Spring	Kiup Spring
Implementation	5 weeks in May – June 2013	6 weeks in July – August 2013	4 weeks in August – September 2013
Maintenance and Monitoring – Year 1	1 week in August 2013 1 week in September 2013	1 week in September 2013	1 week in September 2013
Maintenance and Monitoring – Year 2	1 week in May 2014 1 week in August 2014	1 week in May 2014 1 week in August 2014	1 week in May 2014 1 week in August 2014

### 3.1.9 2.1.9 *Monitoring*

Qualitative monitoring is subjective and/or general, and provides information such as presence or absence of specific plant species, hydrology indicators, or assessment of site conditions. Qualitative monitoring would be performed during each maintenance visit to identify (and correct) problems as they arise to ensure successful habitat restoration.

Monitoring would include photographing the site from precisely documented locations. The purpose of this form of monitoring is to visually document the changes in a landscape over a period of time. In addition, a site journal would be kept to document changes and problems. Negative changes, such as large-scale non-native plant invasions or high native plant mortality,

would be immediately addressed through actions to repair the system. Human impacts, which include trampling, trash dumping, frightening wildlife, and introducing feral pets, would be noted.

### **3.2 2.2 No Action Alternative**

Under the No Action Alternative, restoration of La Madre, Rainbow, and Kiup springs and habitat for the BLM sensitive species springsnails would not occur. The dam at La Madre Spring would remain intact. The hydrologic function of all three springs would continue to be compromised by human activities, grazing, and the presence of invasive native and non-native plant species.

### **3.3 2.3 Alternatives Considered but not Analyzed in Detail**

An alternative including the use of all-terrain vehicles for transport to and from La Madre Spring was considered but not analyzed, because it could cause conflicts with trail users. An alternative that included the use of jackhammers to dismantle the La Madre Dam was considered but not analyzed, because the use of jackhammers would be disruptive and the relatively small size of the dam makes the use of non-motorized equipment feasible.

An alternative that included restoration activities at La Madre Spring but did not include dam removal was initially considered, but has been dismissed. A BLM Red Rock/Sloan Field Office archaeologist performed a literature review and field inspection of the dam in the La Madre Spring vicinity and found that the dam was constructed post-1960. The BLM has also determined that the dam is not historically associated with a historic theme and lacks engineered construction and distinctive qualities. As a result, the BLM finds that the dam is not eligible for listing on the National Register of Historic Places under the Criteria of Eligibility per 36 CFR Part 60.4 or the State/BLM Protocol Agreement (2012), as the feature conforms to resource types that categorically "not eligible" in the State/BLM Protocol Agreement. Under the State/BLM Protocol Agreement, consultation with the State Historic Preservation Office is not necessary.

### **3.4 2.4 Conformance**

The proposed restoration activities have been analyzed within the scope of and have been found to be in conformance with the following goals, objectives, and decisions of the Las Vegas RMP Record of Decision (1998) and the Red Rock Canyon National Conservation Area RMP and Record of Decision (2005).

- RP-1. Provide widest variety of vegetation and habitat for wildlife, fish, and watershed protection; ensure that all riparian areas are in proper functioning condition by achieving an advanced ecological status, except where resource management objectives require an earlier successional stage. Manage vegetation consistent with VG-1 (BLM 1998).
- VG-1. Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (BLM 1998).

- FW-2. Reestablish native fauna (including naturalized species) to historic habitat and improve population numbers in current use areas (BLM 1998).
- SS-1. Manage special status species habitat at the natural community or desired plan community, according to the need of the species (BLM 1998).
- 1B.5 Implement strategies to minimize habitat type conversion fires stemming from invasive exotic annual grasses (BLM 2005).
- 1E.2 Adopt a policy of discouraging recreation use in riparian habitats (BLM 2005).
- 1E.3 Eradicate non-native species with emphasis on tamarisk removal (BLM 2005).
- 1E.4 As a minimum, ensure proper functioning condition of riparian areas. Restore surface flow for riparian vegetation where it has been decreased or eliminated by diversion or impoundment (BLM 2005).

## **4 3.0 Affected Environment**

This Affected Environment section describes the existing conditions of the environmental resources within the project areas. Appendix 1 of the BLM's NEPA Handbook, H-1790-1 (BLM 2008) identifies Supplemental Authorities (i.e., resources) that are subject to requirements specified by statute or executive order and must be considered in all BLM environmental documents. Tables 3-1 and 3-2 below show the resources that have been analyzed in this environmental assessment.

As noted in Tables 3-1 and 3-2, there are several resources that are not present in the project areas or are present but not affected by the proposed action. These resources will not be discussed further. Resources that may be affected are discussed further in the Affected Environment and the Environmental Effects sections.



**TABLE 3-1  
SUPPLEMENTAL AUTHORITIES**

Supplemental Authority	Not Present	Present/ Not Affected	Present/ May be Affected	Rationale
Air Quality		X		The BLM would ensure that any fugitive dust resulting from restoration and maintenance of these springs is managed by using water, where applicable and safe to do so.
Areas of Critical Environmental Concern	X			There are no Areas of Critical Environmental Concern present in the project areas.
Cultural / Historical Resources		X		There are no cultural resources in the springs themselves, and the restoration would be designed in a way to avoid cultural resources in surrounding areas. Archaeological monitors would be present on-site during restoration and maintenance activities. In addition, all parking and equipment staging must be confined to previously disturbed areas. Existing roads would be used to access each project area.
Greenhouse Gas Emissions		X		There are no emission limits for suspected greenhouse gas emissions, and no technically defensible methodology for predicting potential climate changes from greenhouse gas emissions. There are, however, and will continue to be several efforts to address greenhouse gas emissions from federal activities, including BLM authorized uses.
Environmental Justice	X			There are no minority or low-income communities present in the vicinity of the project areas.
Farmlands – Prime or Unique	X			There are no prime or unique farmland designations in the project areas.
Noxious Weeds / Invasive Non-native Species			X	The proposed removal of the invasive species <i>Arundo donax</i> would benefit the La Madre Spring. In addition, other non-native species may be encountered and treated/removed at the three restoration sites. See Chapter 4 – Environmental Effects, Section 4.7.
Native American Religious Concerns	X			No impacts to properties of religious or traditional significance are anticipated. Any disturbances to the visual or audible environment would be short-term and temporary.
Floodplains	X			There are no floodplains present in the project areas.
Riparian / Wetlands			X	The proposed project would impact the existing wetlands, as well as the existing riparian zones. See Chapter 4 – Environmental Effects, Section 4.4.

**TABLE 3-1**  
**SUPPLEMENTAL AUTHORITIES**

Supplemental Authority	Not Present	Present/ Not Affected	Present/ May be Affected	Rationale
Threatened, Endangered Animals	X			<p>The proposed project areas are not within desert tortoise habitat and would not result in any new surface disturbance in tortoise habitat; all vehicles would remain within existing roadways, and turnouts and restoration would be executed manually with hand tools. The project site is situated in very low- to very high-density desert tortoise habitat. No adverse impacts to desert tortoises or their habitat are expected, and no remuneration fees are required. Upon completion of the proposed action, impacts associated with mortality from vehicular traffic would be reduced and habitat would be enhanced and less fragmented. Additionally, compliance with the special stipulations below would help ensure that no affect to desert tortoises occurs.</p> <ol style="list-style-type: none"> <li>1. A speed limit of 25 miles per hour shall be required for all vehicles travelling on the existing access roads.</li> <li>2. Should a desert tortoise enter the area of activity, all activity shall cease until such time that the animal has left the area of its own accord.</li> <li>3. Workers will be instructed to check underneath all vehicles before moving them, as tortoises often take cover underneath parked vehicles.</li> <li>4. Workers will be provided educational information on the desert tortoise, which includes the legal protection and consequences for the violation of the Endangered Species Act. This notice will serve as the Section 7 Determination and no additional paperwork will be provided (Sec 7 Log # NV-052-12-014).</li> </ol>
Threatened, Endangered Plants	X			Not present.
Migratory Birds			X	<p>The proposed action would have a positive effect on migratory birds, as it would add native vegetation. Noise and human activities during restoration activities may temporarily disturb birds causing them to flush from cover or completely avoid the area. Field crew would adhere to mitigation measures to minimize and avoid effects to migratory birds. See Chapter 4 – Environmental Effects, Section 4.6.</p>
Waste – Hazardous / Solid	X			There are no hazardous materials issues present in the project areas.

**TABLE 3-1  
SUPPLEMENTAL AUTHORITIES**

Supplemental Authority	Not Present	Present/ Not Affected	Present/ May be Affected	Rationale
Wilderness			X	La Madre Spring and Rainbow Spring are within La Madre Mountain Wilderness and Rainbow Mountain Wilderness, respectively. Spring restoration would impact wilderness character. See Chapter 4 – Environmental Effects, Section 4.8.
Human Health and Safety			X	The project would entail standard risks involved with hiking, tool use, and herbicide application. See Chapter 4 – Environmental Effects, Section 4.10.
Wild and Scenic Rivers	X			None present.

**TABLE 3-2  
OTHER RESOURCES REVIEWED (NOT SUPPLEMENTAL AUTHORITIES)**

Resource	Not Present	Present/ Not Affected	May be Affected	Rationale
Recreation		X		The proposed project could enhance the public's recreational experience while in the area.
Soils			X	Local soils would be altered, potentially leading to increases in localized erosion. See Chapter 4 – Environmental Effects, Section 4.1.
Visual Resources			X	Kiup Spring: The proposed project activities meet the objectives for the designated Visual Resource Management (VRM) Class III. Rainbow Spring: The proposed project activities meet the objectives for the designated VRM Class I. La Madre Spring: The proposed project activities meet the objectives for the designated VRM Class I. See Chapter 4 – Environmental Effects, Section 4.9.
Fish and Wildlife (other than T&E)			X	Wildlife species in the general area include small mammals, rodents, birds, and reptiles. These species may be found on the adjacent undisturbed lands and could wander into the proposed project areas. In addition to the springsnails, other BLM sensitive species in the area include the following: golden eagle, bighorn sheep, prairie falcon, big brown bat, Mexican free-tailed bat, California myotis, long eared myotis, long-legged myotis, pallid bat, western parastrellous, and small-footed myotis. See Chapter 4 – Environmental Effects, Section 4.5.

**TABLE 3-2**  
**OTHER RESOURCES REVIEWED (NOT SUPPLEMENTAL AUTHORITIES)**

Resource	Not Present	Present/ Not Affected	May be Affected	Rationale
BLM Natural Areas	X			Project areas are not within the North Fork Pine Creek Natural Area.
Fuels / Fire Management		X		<i>Arundo donax</i> is a novel wildland fire fuel. The proposed action would benefit Fuels/ Fire Management. Effective treatment of <i>Arundo donax</i> involves killing or removing the rhizomes. Green-up or growth periods would need to be monitored. Treatments would require careful timing. A survey may be needed to determine any potential presence of <i>Arundo donax</i> upstream. Compliance with fire restrictions when enacted is mandatory, but may be waived on a case-by-case basis by the fire management officer and a line officer. Fire restrictions are typically in effect from May through October.
Geology / Mineral Resources	X			There are no geology/mineral resources present within the project areas.
Hydrology			X	The proposed projects would impact the hydrologic conditions of the local perched aquifers. See Chapter 4 – Environmental Effects, Section 4.2.
Lands / Access		X		Because no new disturbance would be created and vehicles would be kept on already existing roads, there would be no lands/access issues.
Livestock Grazing	X			Not present.
Paleontology	X			No fossil-bearing geological strata would be affected by the undertaking as proposed.
Rangeland Health Standards	X			Not present.
Socioeconomics		X		Although the proposed project of restoring the springs could provide a social benefit (enhancing the environment and spring ecosystems), the benefit would not be to a degree that detailed analysis is required.
Water Resources / Quality			X	The proposed project would alter surface water resource, mainly surface runoff patterns. See Chapter 4 – Environmental Effects, Section 4.3.
Woodlands / Forestry	X			No impacts are expected, because there are no woodlands in the project areas.

**TABLE 3-2**  
**OTHER RESOURCES REVIEWED (NOT SUPPLEMENTAL AUTHORITIES)**

Resource	Not Present	Present/ Not Affected	May be Affected	Rationale
BLM Special Status Plant Species and Sensitive Vegetation Communities, Excluding Federally Listed Species	X			No impacts are expected to BLM special status plant species or sensitive vegetation communities, because there are none in the project areas.
Wild Horses and Burros		X		A portion of the proposed project is near the Red Rock Herd Management Area. There would be no impacts to wild horses and burros because of the location of La Madre and Rainbow Spring within the Herd Management Area. The potential does exist, however, for individuals to see wild horses and burros. Individuals would be informed to not harass (feed, pet, chase, etc.) wild horses and burros if encountered on or near the project areas. If they do see any wild horses and burros, they should keep a safe distance. Wild horses and burros are wild animals and can be unpredictable, especially during foaling and breeding season.
Lands with Wilderness Characteristics	X			Kiup Spring is in an area which underwent an initial wilderness inventory and was determined not to meet the elements of wilderness characteristics. This area was not nominated for wilderness characteristics as part of the Las Vegas RMP Revision, and therefore the BLM did not consider a re-inventory in this area. The proposed action would be in conformance with the existing land use plan as it relates to management of Lands with Wilderness Characteristics. La Madre and Rainbow springs are within designated wilderness.

## 4.1 3.1 Soils

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) conducted soil surveys for the Clark County area in Nevada in 2012. The following are brief descriptions of the soil series within the each of the project areas based on the NRCS Web Soil Survey tool.

### 4.1.1 3.1.1 La Madre Spring

The Boxspring–Scrapy–Rock outcrop association is found in 74 percent of the mapped area of interest surrounding the La Madre Spring. The soil types in this association are discussed below (USDA NRCS 2013a).

**Boxspring and similar soils (Gravelly loam)** comprise approximately 40 percent of the soils found in the mapped area of interest surrounding La Madre Spring (USDA NRCS 2013a). This soil type is shallow, with extremely gravelly loam and very low available water capacity (USDA 2012).

**Scrapy and similar soils (Very gravelly sandy loam)** are found on mountain slopes of 30 to 50 percent. These soils comprise 30 percent of the soils found in this area of interest (USDA NRCS 2013a). Scrapy soils occupy the first 10 to 14 inches followed by a 10 inch layer of bedrock. They are well drained, with high runoff, low to moderate permeability, and high saturated hydraulic conductivity (USDA 2011a).

**Purob and similar soils (Very gravelly loam)** are found on slopes of 8 to 30 percent (USDA NRCS 2013a). These soils have extremely gravelly loam, with a slightly hard, very friable surface. The soil surface comprises approximately 60 percent gravel, 4 percent cobbles, and 1 percent stones. The soils are well drained and usually dry, but may be moist for short periods during winter and early spring months as well as between July and October following convection storms (USDA 2011b).

**Rock outcrop** consisting of a convex cliff area is found near the La Madre Spring (USDA NRCS 2013a).

**Minor components** including Lithic calciustolls, Typic haplustolls, Typic petrocalcids thermic and mesic (shallow gravelly loam), Aridic calcixerolls (gravelly inset fan), Typic torriorthents (upland wash) and another small rock outcrop are also in the La Madre Spring area (USDA NRCS 2013a).

### 4.1.2 3.1.2 Rainbow Spring

The Seralin–Traley–Rock outcrop association is found in 96 percent of the mapped area of interest surrounding the Rainbow Spring (USDA NRCS 2013b). The soil types in this association are discussed below.

**Seralin and similar soils (Very gravelly loam)** comprise about 45 percent of the soils found surrounding Rainbow Spring (USDA NRCS 2013b). Found on mountain slopes from 15 to 75 degrees throughout southern Nevada, this soil type is extremely gravelly with fine, sandy loam.

The soil surface is composed of approximately 65 percent gravel, 10 percent cobbles, and 5 percent stones. Usually dry, soils may be moist in late winter and spring and surrounding summer thunderstorms. The soil is well drained with rapid runoff (USDA 2011c).

**Traley and similar soils (Gravelly loam)** are found surrounding the Rainbow Spring, comprising about 25 percent of the soils in the area (USDA NRCS 2013b). These are deep, well drained soils found on slope ranges from 30 to 50 percent. The soil moisture borders on an ustic regime; usually dry but moist during late winter, early spring, and surrounding summer convection storms (USDA 2006).

**Rock outcrop** consists of a convex cliff comprising approximately 15 percent of the Rainbow Spring surrounding soil types (USDA NRCS 2013b).

**Minor components** reported near the Rainbow Spring include Ardic calciustolls, Seralin, and Lithic ustorthents (USDA NRCS 2013b). These account for approximately 15 percent of the total soil types found in the mapped area of interest.

#### 4.1.3 3.1.3 Kiup Spring

The Boxspring–Potosi–Rock outcrop association is found in 98 percent of the mapped area of interest surrounding the Kiup Spring. The soil types in this association are discussed below (USDA NRCS 2013c).

**Boxspring and similar soils (Gravelly loam)** comprise over 50 percent of the Kiup Spring area soil types (USDA NRCS 2013c). Boxspring soils are found commonly on hills and mountains with a slope of 15 to 50 percent. These soils consist of shallow, gravely well drained soils with high runoff. Typically Boxspring soil profiles include 0 to 15 inches of extremely gravelly loam with 10 inches of Bedrock underneath (USDA 2012).

**Potosi and similar soils (Extremely gravelly loam)** are also found on sloped hills and mountains in southern Nevada and are commonly found near boxspring soils (USDA NRCS 2013c). Potosi soils are well drained, have high surface runoff and moderate rain permeability. Typically Potosi soils are shallow and very gravelly (USDA 2011d).

**Rock outcrop** consists of a sloped, convex shaped cliff area. The rock outcrop occupies approximately 10 percent of the mapped area of interest surrounding the Kiup Spring (USDA NRCS 2013c).

**Minor components** including Seralin, Zeheme, Typic torriorthents, Purob and Scrapy soil types also are found in small amounts near the Kiup Spring (USDA NRCS 2013c).

## 4.2 3.2 Hydrology

La Madre, Rainbow, and Kiup springs are within the Red Rock Canyon and Spring Mountains area. This area is within the Mojave Desert and Basin and Range Physiographic Province, in southern Nevada, and has an arid climate with precipitation provided by thunderstorms in the summer and winter. Average annual precipitation ranges from 3 to over 20 inches. Evaporation

potential typically exceeds annual precipitation due to the high average temperatures and low precipitation.

Basin and Range Province topography is characterized by abrupt changes in elevation, alternating between narrow faulted mountain chains and flat arid valleys or basins. Within the Red Rock Canyon and Spring Mountains area, numerous springs occur where basin valleys meet mountain ranges. The unique ecosystem of springs and seeps are fed by impermeable fault contacts between rock strata of different densities. This causes lateral movement of yearly precipitation which percolates down to the impermeable layer. The Red Rock Canyon and Spring Mountains area supports a unique spring hydrology, because these mountains tend to receive more annual precipitation than other surrounding Nevada ranges (BLM 2005).

The hydrology of many of the springs in the area varies greatly from year to year depending on precipitation amounts. The output of the springs varies seasonally, but is generally fairly low due to the rapid infiltration on alluvia, which mainly comprises gravels and porous sandy soils. For most springs, their greatest output is during the late spring and early summer, when the springs are mainly recharged by winter precipitation and infiltration. While some springs such as La Madre, Rainbow, and Kiup contain water year round, many others typically fail by mid-summer and resume flowing in the fall (BLM 2005).

### **4.3 3.3 Water Resources / Quality**

Surface water is relatively scarce in the Red Rock Canyon and Spring Mountains area. Ephemeral streams provide natural distribution of water and sediments within the floodplains, recharge for the groundwater in the region, and a sporadic but local water supply for wildlife.

Ephemeral streams occur during the immediate surface run-off from storm events. These storm events occur primarily during the Gulf-produced monsoon season of late summer and early fall. The persistence of such streamflows is limited to the duration of storm events, since the water is quickly absorbed into the dry channel bottom. Pools may persist for some days afterward, however, depending on soil and gravel substrate, shading, and rainfall amount variables (BLM 2005). Tinajas may also occur in vicinities that lack spring sources (e.g., Brownstone Canyon and Little Red Rocks) and include natural water impoundments in the sandstone that provide near-perennial water sources that support a variety of wildlife (BLM 2005).

Groundwater quality in the Basin and Range aquifers varies by basin. Generally, groundwater quality is high near the alluvial fan deposits at the base of mountain ranges. Groundwater quality decreases where increased discharge or excessive evaporation in confined basins has resulted in salination of groundwater (Planert and Williams 1995).

### **4.4 3.4 Riparian / Wetlands**

As stated in Executive Order 11990—Protection of wetlands, wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically



adapted for life in saturated soil conditions (42 Federal Register 26961). These areas have visible vegetation and other physical characteristics reflective of a permanent water source. Such areas vary from one location to another, depending on water availability and quality, elevation, climate, soils, and topography (BLM 1998). All riparian areas support a great diversity of plant and animal species due to their unique water supplies. Riparian areas in the BLM Southern Nevada District are primarily associated with perennial streams and springs (BLM 1998).

A riparian/wetland area is an area of land directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lakeshores and streambanks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil. Such areas vary from one location to another, depending on water availability and quality, elevation, climate, soils, and topography (BLM 1998). Despite this variability, all riparian areas share the following characteristics:

- Small in comparison with the overall area
- Create a well-defined zone within a much drier ecosystem
- Support a great diversity of plant and animal species

Because riparian areas provide habitat for approximately 80 percent of terrestrial species within the Great Basin ecological region (Thomas 1979 as cited in BLM 2005), western riparian areas compromise one of BLM's highest program priorities. The Red Rock Canyon National Conservation Area is of particular concern to the BLM because of the unique biotic diversity of the Spring Mountains (BLM 2005).

La Madre, Rainbow, and Kiup springs each sustain wetlands and riparian areas. The vegetation surrounding these springs include meadow species, rushes, sedges, grasses, and willows. Because precipitation, high evapotranspiration rates, and sandy porous soils all combine to restrict the surface influence of the local spring waters (BLM 2005), the riparian vegetation in these areas is confined to narrow corridors along the springs. Each spring is discussed separately below.

#### 4.4.1 3.4.1 La Madre Spring

La Madre Spring is at an elevation of 5,500 feet and is within the pinyon–juniper vegetation community. Table 3-3 presents descriptive data for La Madre Spring from studies by BLM and The Nature Conservancy (Sada and Nachlinger 1998). The low discharge of La Madre Spring provides a shallow stream for a relatively long distance.

**TABLE 3-3  
ATTRIBUTES OF LA MADRE SPRING**

Elevation	5,500 feet / 1,692 meters
Discharge	5.7 liters/minute
Length	2,000 meters
Depth	5 centimeters
Width	50 centimeters

Emergent and bank cover is very dense, and is a mix of native sedges (including areas of dense California saw grass [*Cladium californicum*]) and dense patches of the invasive giant reed. Sada and Nachlinger recorded a diversity of 28 species, including 3 exotics. Native wetland species included 4 obligate and 11 facultative species.

#### 4.4.2 3.4.2 Rainbow Spring

Rainbow Spring passes through a small meadow and then flows onto loose soil covering the bottom of an arroyo where it disappears. The meadow is in good condition, although trails used by equestrians and off-highway vehicles create a threat that could degrade the spring meadow.

Rainbow Spring is at an elevation of 5,645 feet and is within the pinyon–juniper vegetation community. Table 3-4 presents descriptive data for Rainbow Spring from studies by BLM and The Nature Conservancy (Sada and Nachlinger 1998).

**TABLE 3-4  
ATTRIBUTES OF RAINBOW SPRING**

Elevation	5,645 feet / 1,721 meters
Discharge	30 liters/minute
Length	400 meters
Depth	20 centimeters
Width	30 centimeters

Emergent and bank cover is very dense, and is a mix of native sedges and grasses. Sada and Nachlinger recorded a diversity of 18 species, including 4 exotics. Native wetland species included four obligate and nine facultative species.

#### 4.4.3 3.4.3 Kiup Spring

Kiup Spring is surrounded by very dense patches of grasses, forbs, and shrubs. There is high surface moisture in this area resulting in dense vegetation. Water is brought by a buried pipe and forms an approximately 14-inch diameter pool. The bottom of the pool consists of small cobbles and large gravel. Several smaller pools can be found further down as the water resurfaces along ungulate trails.

Kiup Spring is at an elevation of 5,240 feet and is within the pinyon–juniper vegetation community. Table 3-5 presents descriptive data for Kiup Spring from studies by BLM and The Nature Conservancy (Sada and Nachlinger 1998).

**TABLE 3-5  
ATTRIBUTES OF KIUP SPRING**

Elevation	5,240 feet / 1,597 meters
Discharge	5.7 liters/minute
Length	20 meters
Depth	1 centimeter
Width	10 centimeters

Emergent and bank cover is very dense, and is a mix of native sedges and grasses. Sada and Nachlinger recorded a diversity of 29 species, including 12 exotics. Native wetland species included four obligate and seven facultative species.

#### **4.5 3.5 Wildlife Excluding Federally Listed Species**

Wildlife species in the general area include small mammals, rodents, birds, reptiles, and amphibians. These species may be found within and adjacent to the spring project areas. Wildlife species in the general area are common and widely distributed.

##### **4.5.1 3.5.1 BLM Sensitive Wildlife Species**

Sensitive species are those designated by the BLM State Director in cooperation with state wildlife agencies. Species may be added to or removed from the BLM sensitive species list periodically. According to BLM Manual 6840, BLM sensitive species must meet the following criteria to be considered for sensitive species listing:

- They must be native species found on BLM-administrated lands for which BLM has the capability to significantly affect the conservation status of the species through management.
- Information is available that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range.
- The species depends on ecological refugia or specialized or unique habitats on BLM-administrated lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk.
- All federally designated candidate species, proposed species, and delisted species in the 5 years following their delisting shall be conserved as BLM sensitive species.

BLM sensitive species found within the project areas are discussed below.

##### **4.5.1.1 3.5.1.1 Golden Eagle**

The golden eagle (*Aquila chrysaetos*) is found year-round throughout Nevada with some seasonal shifts in population. Golden eagles often nest on cliffs, but sometimes nest on the ground, in trees, or on steep hillsides. Terrestrial hunters, golden eagles commonly eat large rodents and medium-sized birds. Main threats to the golden eagle include reduction in prey populations, vehicle injuries and mortality, and human disturbance to nest areas. Conservation strategies for this species include providing good cliff habitats and managing open habitats for healthy mammalian prey populations, especially jackrabbits and cottontails (Great Basin Bird Observatory 2013).

##### **4.5.1.2 3.5.1.2 Bighorn Sheep**

The desert bighorn sheep is found mainly in desert mountain ranges throughout the Southwest. Bighorn sheep prefer steep, rocky terrain and usually live no more than two miles from a permanent water source. There are more than 13,000 acres of prime bighorn sheep habitat in the Red Rock Canyon National Conservation Area. Bighorn sheep commonly migrate seasonally, using larger upland areas in warmer months and concentrating in sheltered valleys during the

winter. The conservation area is home to an estimated 80 desert bighorn sheep. Wild burros in the area are known to compete with the bighorn for water.

#### **4.5.1.3 3.5.1.3 *Prairie falcon***

The prairie falcon (*Falco mexicanus*) is found widely across North America. Its habitat includes arid open country, alpine tundra, prairie, and desert. During winter, the prairie falcon may be found more in low deserts and occasionally in towns. The prairie falcon hunts small mammals and birds and nests on cliff ledges. Threats to this species include loss of cliff habitats and decreasing prey populations as well as human disturbances.

#### **4.5.1.4 3.5.1.4 *Big brown bat***

The big brown bat (*Eptesicus fuscus*) is found commonly in small, widely dispersed populations throughout unique habitats in Nevada. They live in caves, trees, abandoned mines, buildings, and under bridges. Big brown bats are nocturnal, and hunt for many kinds of insects over open land, water, and forest. The main threats to these bats are loss of habitat, light and sound pollution, and human disturbances (Nevada Department of Wildlife 2013a).

#### **4.5.1.5 3.5.1.5 *Mexican free-tailed bat***

The Mexican free-tailed bat (*Tadarida brasiliensis*) is found widely across the Americas. Although it is one of the most abundant mammals in North America, it is especially vulnerable to human disturbance. This is because the bat roosts in large numbers in relatively few roosts, creating a greater possibility of habitat destruction. Populations of Mexican free-tailed bat are currently declining.

#### **4.5.1.6 3.5.1.6 *California Myotis***

The California myotis (*Myotis californicus*) is found along the majority of western North America. This bat has a wide variety of habitats from forests and coastal cliffs to desert conditions. Common roosts include rocky hillsides, outcrops, trees with exfoliating bark, buildings, and other small cavities. They frequently rotate roost sites and are known to be quick to occupy new sites. California myotis generally live in small colonies and eat small insects (California Department of Fish and Wildlife 1999).

#### **4.5.1.7 3.5.1.7 *Long-eared Myotis***

The long-eared myotis (*Myotis evotis*) roosts in caves, rocks, cracks in the ground, and cavities in large trees and is usually found at high elevations. This species is found throughout much of western North America. The long-eared myotis is insectivorous and its diet primarily consists of moths, flies, beetles, and net-winged insects. These bats can have a long lifespan, with some living up to 22 years. The main threats to the long-eared myotis are loss of habitat, predation by snakes, raccoons, and large birds of prey, and human disturbances (Buseck and Keinath 2004).

#### **4.5.1.8 3.5.1.8 *Long-legged Myotis***

The long-legged myotis (*Myotis volans*) is a species of bat found across coastal ranges from Oregon to Mexico, from Sierra Nevada ranges to southern California, in the Great Basin region, and in several Mojave Desert mountain ranges. Most common in woodland and forest habitats

above 4,000 feet, the long-legged myotis feeds on flying insects, primarily moths. They roost in rock crevices, buildings, tree bark, mines, and caves. These bats commonly use separate day and night roosts. The long-legged myotis are threatened by habitat destruction and human disturbances (California Department of Fish and Wildlife 1988).

#### **4.5.1.9 3.5.1.9 Pallid Bat**

The pallid bat (*Antrozous pallidus*) usually lives in small and widely dispersed populations. These bats commonly roost in rock crevices, buildings, tree cavities, caves, and mines. The pallid bat hunts its prey on the ground. Its diet consists mainly of large insects including scorpions, centipedes, grasshoppers, crickets, and beetles (Nevada Department of Wildlife 2013b).

#### **4.5.1.10 3.5.1.10 Western Parastrellous**

The western parastrellous (*Parastrellus Hesperus*) is a small, insectivorous bat found in desert scrub, arid grassland habitats, and adjacent woodlands. They are most abundant in desert regions, roosting most often in rocky canyons, and cliffs. The western parastrellous forages over water, rocky canyons, and the faces of cliffs (California Department of Fish and Wildlife 2005).

#### **4.5.1.11 3.5.1.11 Small-footed Myotis**

The small-footed myotis (*Myotis ciliolabrum*) is a small species of bats, which lives in rock outcrops, caves, mines, and trees. They are found throughout western North America and feed on flying insects. The small-footed myotis is threatened by habitat destruction, and human disturbances.

#### **4.5.1.12 3.5.1.12 Springsnail**

Springsnail species (*Pyrgulopsis* spp.) are endemic macroinvertebrates that are associated with perennial desert springs. Several species are listed by the BLM as sensitive, including the *Pyrgulopsis deaconi* and the *Pyrgulopsis turbatrix*. These tiny snails (<4 mm in height) occurred commonly throughout the Mojave Desert during the last ice age, but are now mostly restricted to small creeks and springs. Springsnails are BLM sensitive species because of recent extirpations; threats include drying of habitat and/or diversion of water for spring development. Conservation efforts include promoting the creation and monitoring of springsnail habitats.

All three springs included in this proposed project supported historic habitat for the southeast Nevada springsnail and the Spring Mountains springsnail—both BLM sensitive species that were first described in 1998. La Madre and Kiup springs continue to provide habitat for one species each, but recent surveys have not observed springsnails at Rainbow Spring. Springsnails tend to occupy areas of slow moving water over sand, gravel, cobble, or aquatic vegetation.

The southeast Nevada springsnail is found at 10 locations (Sada 2009), making it one of the most widely distributed springsnails in southern Nevada. This species is common at La Madre Spring (Sada 2002). The large population that occurred at Willow Spring in Red Rock Canyon National Conservation Area was eliminated once water was diverted into pipes and troughs for the Willow Spring picnic area.

The Spring Mountains springsnail is found at four locations (Sada 2009), and is scarce at Kiup Spring (Sada 2002). These snails were once found at multiple springs in the Red Rock Canyon National Conservation Area, but populations have since declined drastically due to the disappearance or disturbance of their water source.

#### **4.6 3.6 Migratory Birds**

Under the Migratory Bird Treaty Act of 1918 and subsequent amendments (16 United States Code 703-711), it is unlawful to take, kill, or possess migratory birds. A list of the protected bird species can be found in 50 CFR 10.13.

Numerous bird species travel through Nevada during spring and fall migrations. The Red Rock Canyon National Conservation Area and surrounding area is an oasis in the desert for many of these migratory birds. Over 100 bird species have been identified within the conservation area. The proposed project areas contain potential habitat for migratory birds, including foraging, cover, and nesting habitat. Typically, the breeding season is when these species are most sensitive to disturbance, which generally occurs from March 1<sup>st</sup> through August 31<sup>st</sup>.

#### **4.7 3.7 Noxious Weeds / Invasive Non-native Species**

The La Madre, Rainbow, and Kiup springs provide unique environments for numerous plants including some non-native, invasive plants. Invasive annual grasses in particular can outcompete native plants after wildland fires, which are a common threat throughout the Mojave Desert for plants and wildlife. Such fires remove nutrient-rich vegetation and shade, destroying habitats for plants and animals. Often invasive grasses regenerate more quickly than the native vegetation, which creates an increased risk of brush fires. Native vegetation has a decreasing ability of becoming dominant in the plant community following fires. Rehabilitation efforts help combat the spread of non-native invasive plant species by introducing native vegetation, monitoring regrowth, and periodic weed treatments.

Noxious weeds are spread through many vectors, including vehicles and equipment. Soil disturbances and loss of native plant species increase the spread of noxious and invasive species. Non-native plants or invasive weeds are a major concern due to their potential to cause permanent damage to the natural plant communities. The USDA, Nevada Department of Agriculture, and BLM maintain lists of non-native plants of special concern. Many of these species—including Bermuda grass, giant reed, Russian thistle (*Salsola* sp.), and saltcedar—are likely found within the project areas. These species and treatment methods are discussed in Appendix B.

The BLM uses vegetation treatments such as herbicides and non-herbicide treatment methods. Non-herbicide treatment methods include fire and mechanical, manual, and biological controls to combat the increase in non-native invasive plant species. The BLM's Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States, Programmatic Environmental Impact Statement (BLM 2007) provides guidance on using different methods to manage vegetation on BLM-administered lands.

## **4.8 3.8 Wilderness**

The Wilderness Act of 1964 provides criteria for determining suitability and establishes restrictions on activities that can be undertaken in a designated area. Criteria set by Congress within this act states that wilderness has the following characteristics: 1) generally appears to have been affected primarily by the forces of nature, with the imprint of humankind's work substantially unnoticeable; 2) has outstanding opportunities for solitude or a primitive and confined types of recreation; 3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and 4) may also contain ecological, geological or other features of scientific, educational, scenic, or historical value. The Wilderness Act also sets the accepted and prohibited uses of designated wilderness. It sets special provisions for an agency's continuing management of existing or grandfathered rights such as mining and grazing and other agency mission-related activities.

Wilderness is generally managed to preserve the area in its natural state, to keep it undeveloped and untrammelled by human actions, and to provide opportunities for solitude and primitive forms of recreation. Travel in wilderness is limited to foot or equestrian conveyance. Motorized vehicles, bicycles, and any other form of mechanized equipment are prohibited in these areas to protect the solitude, primitive nature, and biological values of these special places.

La Madre Spring is within La Madre Mountain Wilderness and Rainbow Spring is within Rainbow Mountain Wilderness (see Figure 1-1). Recreational uses of these areas include day hiking, backpacking, caving, photography, equestrian use, rock hounding, big game and upland bird hunting, wildflower viewing, bird watching, sightseeing, and other activities. There are outstanding opportunities for solitude in both La Madre Mountain Wilderness and Rainbow Mountain Wilderness. A variety of geologic formations and vegetative screens provide excellent opportunities for solitude. La Madre Mountain Wilderness and Rainbow Mountain Wilderness are also highly scenic.

## **4.9 3.9 Visual Resources**

This section addresses the affected environment associated with visual resources that includes Visual Resource Management (VRM) classes. Visual Contrast Rating forms were developed for each of the three spring sites (Appendix C). Visual resources for each site are presented below.

### **4.9.1 3.9.1 La Madre Spring**

La Madre Spring is on BLM-administered lands in the La Madre Mountain Wilderness Area within the Red Rock Canyon National Conservation Area. The spring can be accessed from Highway 159 to the Scenic Loop Road west of Las Vegas along the southern portion of the Red Rock Canyon National Conservation Area to Rainbow Spring Road. The area surrounding Rainbow Spring is generally hilly to mountainous, with rocky terrain and steep slopes. The Visual Contrast Rating Form for La Madre Spring, including representative photographs, is provided in Appendix C.



Visitors to La Madre Spring would see the spring when approaching it along the access road. Spring-associated vegetation surrounding the springhead can also be viewed when approaching the spring. La Madre Spring has been significantly altered by past human disturbance and invasive native and non-native plant species. This spring is infested with giant reed and has a human-made dam, which has altered hydrologic conditions at the spring.

The BLM-administered lands in the area of La Madre Spring (and within the La Madre Mountain Wilderness) are classified as VRM I. The objective for this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

#### **4.9.2 3.9.2 Rainbow Spring**

Rainbow Spring is on BLM-administered lands in the Rainbow Mountain Wilderness Area within the Red Rock Canyon National Conservation Area. The spring can be accessed from Highway 160 west of Las Vegas along the southern portion of the Red Rock Canyon National Conservation Area to Rainbow Spring Road. The area surrounding Rainbow Spring is generally hilly to mountainous, with rocky terrain and steep slopes. The Visual Contrast Rating Form for Rainbow Spring, including representative photographs, is provided in Appendix C.

Visitors to Rainbow Spring would see the spring when approaching it along the access road. Spring-associated vegetation surrounding the springhead can also be viewed when approaching the spring. Rainbow Spring has been significantly altered by past human disturbance and invasive native and non-native plant species. The spring was also heavily grazed in the past and has a dense cover of native sedges and rushes.

The BLM-administered lands in the area of Rainbow Spring (and within the Rainbow Mountain Wilderness) are classified as VRM I. The objective for this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

#### **4.9.3 3.9.3 Kiup Spring**

Kiup Spring is on BLM-administered lands adjacent to the Spring Mountains National Recreation Area, which is part of the Humboldt–Toiyabe National Forest in Nevada. The spring is within Trout Canyon, and access is generally from Highway 160 west of Las Vegas to Trout Canyon Road. The area surrounding Kiup Spring is generally hilly to mountainous, with rocky terrain and steep slopes. The Visual Contrast Rating Form for Kiup Spring, including representative photographs, is provided in Appendix C.

Visitors to Kiup Spring would see the spring as they approach along the access trail, which is downstream from the spring. Spring-associated vegetation screens the view of the actual springhead. Kiup Spring has been significantly altered by past human disturbance and invasive native and non-native plant species.



The BLM-administered lands in the area of Kiup Spring are classified as VRM Class III. The objective for this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape may be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

#### **4.10 3.10 Human Health and Safety**

This section addresses the affected environment associated with human health and safety against which potential impacts may be measured. This section tiers to the BLM's Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States, Programmatic Environmental Impact Statement (BLM 2007) in its description of human health risks related to accidents and herbicide use during vegetation treatment activities, as well as its identification of standard operating procedures and measures to minimize safety hazards related to the use of herbicides on BLM-administered lands.

La Madre, Rainbow, and Kiup springs are within BLM-administered lands west of Las Vegas, Nevada. La Madre Spring and Rainbow Spring are within the Red Rock Canyon National Conservation Area. Facilities at Red Rock Canyon National Conservation Area also include a law enforcement building and fire station complex.

##### **4.10.1 3.10.1 La Madre Spring**

La Madre Spring is within 3 miles of the Red Rock Canyon National Conservation Area scenic drive. This spring receives a relatively high level of visitation due to its proximity to the scenic drive, ease of access to the trail, and regular use by equestrian recreationists.

##### **4.10.2 3.10.2 Rainbow Spring**

Rainbow Spring is within the Red Rock Canyon National Conservation Area and north of the community of Mountain Spring. Rainbow Spring is in a remote area of the Red Rock Canyon National Conservation Area, with a lower level of visitation than La Madre Spring. Due to its relative proximity to Mountain Spring, the Rainbow Spring area likely has a higher level of visitation.

##### **4.10.3 3.10.3 Kiup Spring**

Kiup Spring is in a remote area north of Highway 160. There is an unpaved road to this spring, and the level of visitation to Kiup Spring is relatively low overall.

## **5 4.0 Environmental Effects**

In this section, the proposed action is analyzed to assess direct, indirect, and cumulative impacts to all elements of the environment that would be affected by this project.

The cumulative impacts analysis evaluates the combined incremental effects of human activity within the scope of the project. The Council on Environmental Quality regulations define the scope and state that connected actions, cumulative actions, and similar actions should be included in the impact analysis (40 CFR 1508.25).

The La Madre Mountain Wilderness and Rainbow Mountain Wilderness were designated in 2002. The springs within these areas, as well as Kiup Spring, have received increased visitation, as the population and visitation in the Las Vegas area have increased. Increased visitation to the area has required additional trailheads, parking, signage, and informational kiosks. In the past, impacts to these springs also included grazing and OHV use. Management within the Spring Mountain area and Red Rock Canyon Natural Conservation Area includes restoration plans for several areas, including Willow Spring.

### **5.1 4.1 Soils**

#### **5.1.1 4.1.1 Proposed Action**

The proposed action would likely result in adverse impacts to soils from restoration activities. Soils would be disturbed during vegetation removal activities, dam removal (at La Madre Spring only), pond creation activities, installation of native vegetation, and installation of fencing (at Rainbow Spring only). Soils would be more susceptible to localized erosion by wind and water after disturbance. Disturbance due to restoration activities would be short-term. Restoration of native vegetation and addition of natural or synthetic geotextile materials would stabilize soils to prevent soil erosion. Herbicide treatments and monitoring activities would not result in soil disturbances.

The proposed action includes environmental design and resource protection measures that would minimize impacts to soils, including the following:

- avoiding unnecessary disturbance to soils during vegetation removal activities (minimal soil surface disturbance and minimal excavation)
- avoiding soil disturbance within restoration activity Zone B (Transition Zone)
- installing native vegetation
- installing fencing to protect Rainbow Spring from vehicle trespass

#### **5.1.1.1 Cumulative Impacts**

The cumulative effects study area for soils is the Spring Mountains area (see Figure 1-1). Existing conditions for soils are described in Section 3.1. Past and present cumulative impacts to soils include recreational activities (including OHV use) livestock grazing, wild burro use, and water development at all three springs. These impacts have been minor, and widespread degradation of soil quality has not occurred. Reasonably foreseeable future actions, including the proposed

spring restoration, would result in temporary impacts to soils, primarily due to vegetation removal. Restoration activities under the proposed action would reduce invasive plant species and improve soil quality in the long term. The minor short-term potential impacts from implementing the proposed action and the environmental design and protection measures—in addition to the past, present, and reasonably foreseeable future actions within the cumulative area—would result in negligible impact to soils.

#### **5.1.2 4.1.2 No Action Alternative**

Under the No Action Alternative, current conditions would continue and restoration of La Madre, Rainbow, and Kiup springs would not occur. Soils at these springs would not be disturbed by restoration activities. Negligible disturbance could occur as a result of human activities in the area of the springs (e.g., recreational use).

### **5.2 4.2 Hydrology**

#### **5.2.1 4.2.1 Proposed Action**

The proposed action would likely result in adverse impacts to hydrology from restoration activities. Restoration activities would impact hydrology during vegetation removal activities, dam removal (at La Madre Spring only), pond creation activities, installation of native vegetation, and installation of natural or synthetic geotextile materials. These activities would likely result in short-term impacts. Environmental design and resource protection measures outlined above to minimize impacts to soils would also minimize impacts to hydrology. Removal of the La Madre Dam would create a beneficial impact by restoring the natural hydrologic conditions, improving habitat for the BLM sensitive springsnail, and restoring the spring's natural function.

##### **5.2.1.1 Cumulative Impacts**

The cumulative effects study area for hydrology is the Spring Mountains area (see Figure 1-1). Existing conditions for hydrology are described in Section 3.2. Past and present cumulative impacts include recreational activities, grazing at all three springs, and development of the dam at La Madre Spring. These impacts have been minor, and widespread degradation of hydrology of the springs has not occurred. Reasonably foreseeable future actions, including the proposed spring restoration, would result in temporary impacts to hydrology. Restoration activities under the proposed action would improve hydrologic function in the long term, thereby reducing the effect of cumulative impacts to hydrology in the long term. The minor short-term potential impacts from implementing the proposed action and environmental design and protection measures—in addition to the past, present, and reasonably foreseeable future actions within the cumulative area—would result in negligible impact to hydrology.

#### **5.2.2 4.2.2 No Action Alternative**

Under the No Action Alternative, current conditions would continue and restoration of La Madre, Rainbow, and Kiup springs would not occur. The dam at La Madre Spring would remain

intact. The hydrologic function of all three springs would continue to be compromised by human activities, grazing, and the presence of invasive native and non-native plant species.

### **5.3 4.3 Water Resources/Quality**

#### **5.3.1 4.3.1 Proposed Action**

The proposed action would result in adverse impacts to water resources and water quality from restoration activities. Restoration activities within the springs would impact water and water quality during vegetation removal activities, dam removal (at La Madre Spring only), pond creation activities, installation of native vegetation, installation of natural or synthetic geotextile materials, and possibly during vegetation treatment. These activities would likely result in short-term impacts. Restoration of the springs would result in improved hydrologic function of the springs and beneficial impacts to water quality overall. Environmental design and resource protection measures to minimize impacts to soils would also minimize impacts to water resources and water quality at the springs. In addition, the following measures would also be included to minimize impacts to water quality:

- Weed-free straw wattles will be placed in streams to protect downstream resources from increased turbidity and/or detritus that is likely to result from removal of vegetative material.
- All vegetation and dam material will be removed from spring areas to reduce litter within streams.
- Sediment control logs will be placed in areas where giant reed has been removed to minimize erosion into streams.

#### **5.3.1.1 Cumulative Impacts**

The cumulative effects study area for water resources/quality is the spring areas and vicinity (see Figure 1-1). Existing conditions for water resources/quality are described in Section 3.3. Cumulative effects to water quality occur as a result of drought, wildlife use, livestock grazing, wild burro use, recreational activities (including OHV use), and water development. Water quality and hydrology of the springs are adversely affected by these impacts. As described above, the proposed action would result in additional temporary impacts to water quality and riparian areas. The proposed action includes measures that would reduce or eliminate these impacts, and the restoration of springs would result in improved hydrologic function and beneficial impacts to water quality. The minor short-term potential impacts from implementing the proposed action, environmental design, and protection measures—in addition to the past, present, and reasonably foreseeable future actions within the cumulative area—would result in negligible, if any, impact to water quality and hydrology in the long-term.

#### **5.3.2 4.3.2 No Action Alternative**

Under the No Action Alternative, current water quality conditions would continue and restoration of La Madre, Rainbow, and Kiup springs would not occur. The dam at La Madre Spring would remain intact. Springs and riparian areas in the Spring Mountains have historically

sustained significant cumulative impacts, which would continue under the No Action Alternative.

## **5.4 4.4 Riparian/Wetlands**

### **5.4.1 4.4.1 Proposed Action**

The proposed action would result in adverse impacts to the riparian area/wetlands of the springs. Restoration activities within the springs would impact the spring riparian/wetland areas during vegetation removal activities, dam removal (at La Madre Spring only), pond creation activities, installation of native vegetation, installation of natural or synthetic geotextile materials, and during vegetation treatment. These activities would result in short-term impacts.

Removal of invasive native and non-native species that have altered the vegetation community function would result in beneficial impacts to the riparian/wetland areas of the springs. Restoration of the springs using native species would increase native plant diversity and improve habitat for springsnails. Habitat would also likely be improved for other wildlife species, such as migratory birds and small mammals. Installation of natural materials and geotextiles to suppress native vegetation in some areas would also improve the riparian area functions.

Environmental design and resource protection measures to minimize impacts to water resources and water quality at the springs would also serve to minimize impacts to the riparian/wetland areas.

#### **5.4.1.1 Cumulative Impacts**

The cumulative effects study area for riparian/wetlands is the spring areas and vicinity (see Figure 1-1). Existing conditions for riparian/wetlands are described in Section 3.4. Cumulative effects to riparian/wetland resources would be essentially the same as described above for hydrology and water quality. As described above, the proposed action would result in temporary impacts to riparian/wetland areas. The proposed action includes measures that would reduce or eliminate these impacts, and the restoration of springs would result in improved riparian/wetland condition. The minor short-term potential impacts from implementing the proposed action, environmental design, and protection measures—in addition to the past, present, and reasonably foreseeable future actions within the cumulative area—would result in negligible impact to riparian/wetlands.

### **5.4.2 4.4.2 No Action Alternative**

Under the No Action Alternative, current conditions would continue and restoration of La Madre, Rainbow, and Kiup springs would not occur. The dam at La Madre Spring would remain intact. Invasive plant species infestations at the springs would continue, as would existing altered hydrologic conditions. Springsnail habitat would continue to be impacted by existing conditions.

## 5.5 4.5 Wildlife Excluding Federally Listed Species

### 5.5.1 4.5.1 Proposed Action

The proposed action may result in adverse impacts to wildlife, including BLM sensitive species. Impacts may include direct mortality from vehicular traffic and disturbance of foraging, cover, and nesting habitat during vegetation removal and other restoration activities. These impacts would be short-term. Wildlife species in the general area are common and widely distributed throughout the area. The loss of some individuals and/or their habitat would have a negligible impact on populations of the species throughout the region. Upon completion of the proposed action, impacts associated with mortality from disturbance activities (e.g., illegal OHV use) would be reduced and habitat would be enhanced and less fragmented. Overall improvement to the vegetation community and hydrologic function of the springs after restoration would result in a beneficial impact to wildlife.

Under the proposed action, impacts would occur to the two BLM sensitive species springsnail (*Pyrgulopsis deaconi* and *Pyrgulopsis turbatrix*). Impacts may include direct mortality during vegetation removal, dam removal, and other restoration activities. Springsnail habitat disturbance would also occur during these activities. Beneficial impacts to the springsnail populations within the springs would occur as a result of the proposed action, including improved hydrologic function, enhanced pools, and restoration of native plant species habitat.

Environmental design and resource protection measures to minimize impacts to soils and water quality would also minimize impacts to wildlife and BLM sensitive species at La Madre, Rainbow, and Kiup springs. In addition, the following measures would also be included to minimize impacts to wildlife and BLM sensitive species:

- At La Madre Spring, the dam will be inspected for springsnails once the majority of the water is removed from behind the dam. If any springsnails are located, they will be transported to a safe portion of the project area with adequate (but not excessive) water, rocks, and forage.
- At Rainbow Spring, fencing will be installed at the Rainbow Mountain Wilderness boundary to protect the spring from vehicle trespass, but allow desert bighorn sheep (and other large mammals) passage. The fence will conform to BLM standards for wildlife fencing.

#### 5.5.1.1 Cumulative Impacts

The cumulative effects study area for wildlife is the Spring Mountains area (see Figure 1-1). Existing conditions for wildlife are described in Section 3.5. Past and present cumulative impacts include recreational activities (including OHV use) livestock grazing, wild burro use, and water development within all three springs, which have resulted in negative effects to wildlife habitat (forage, cover, and nesting resources). Impacts to wildlife have been minor overall and widespread degradation of wildlife habitat has not occurred. Reasonably foreseeable future actions, including the proposed spring restoration, would result in temporary impacts to wildlife habitat, primarily due to vegetation removal and noise during restoration activities. Restoration

under the proposed action would reduce invasive plant species and improve the riparian/wetland condition in the long term, thereby reducing the effect of cumulative impacts to wildlife in the long term. The minor short-term potential impacts from implementing the proposed action, environmental design, and protection measures—in addition to the past, present, and reasonably foreseeable future actions within the cumulative area—would result in negligible impact to wildlife.

#### **5.5.2 4.5.2 No Action Alternative**

Under the No Action Alternative, current conditions would continue, and restoration of La Madre, Rainbow, and Kiup springs would not occur. Restoration of habitat for the BLM sensitive species springsnails would not occur. The dam at La Madre Spring would remain intact. The hydrologic function of all three springs would continue to be compromised. The springs would continue to experience invasive plant species infestations and altered hydrologic conditions. Springsnail habitat would continue to be impacted by existing conditions.

### **5.6 4.6 Migratory Birds**

#### **5.6.1 4.6.1 Proposed Action**

The proposed action would result in adverse impacts to migratory birds. These impacts would include loss of foraging, cover, nesting habitat, and potentially direct mortality during vegetation removal and from disturbance from noise and human activities during restoration activities. These impacts would be short-term. Noise and human activities during restoration activities may temporarily disrupt birds causing them to flush from cover or completely avoid the area. This disturbance would only occur during daylight hours when crews are working on-site.

The proposed action would result in beneficial impacts to migratory birds, as it would add native vegetation. Over the long-term, there would be beneficial impacts to migratory bird species, as the existing invasive vegetation and dense native cover would be replaced by native vegetation and proper riparian condition. Improved vegetation condition would provide better foraging, cover, and nesting habitat for migratory birds.

Environmental design and resource protection measures to minimize impacts to soils and water quality would also minimize impacts to migratory birds at the springs. In addition, the following measure would also be included to minimize impacts:

- During phases of the project that occur during the breeding season, a qualified biologist must survey the area for nests prior to commencement of construction activities. This shall include burrowing and ground-nesting species in addition to those nesting in vegetation. If any active nests (containing eggs or young) are found, an appropriately sized buffer area must be avoided until the young birds fledge.

#### **5.6.1.1 Cumulative Impacts**

The cumulative effects study area for migratory birds is the same as for wildlife, the Spring Mountains area (see Figure 1-1). Existing conditions for migratory birds are described in Section

3.6. Cumulative impacts to migratory birds would be similar to those for wildlife and would be minor overall. Reasonably foreseeable future actions, including the proposed spring restoration, would result in temporary impacts to migratory birds, primarily due to vegetation removal and noise during restoration activities. Environmental design and resource protection measures to minimize impacts to migratory birds under the proposed action would reduce cumulative impacts. Restoration activities under the proposed action would remove invasive plant species and improve the riparian/wetland condition in the long term, thereby reducing the effect of cumulative impacts to migratory birds in the long term. The minor short-term potential impacts from implementing the proposed action, environmental design, and protection measures—in addition to the past, present, and reasonably foreseeable future actions within the cumulative area—would result in negligible impact to migratory birds.

#### **5.6.2 4.6.2 No Action Alternative**

Under the No Action Alternative, current conditions would continue; and restoration of La Madre, Rainbow, and Kiup springs would not occur. Restoration of habitat for the BLM sensitive species springsnails would not occur. The hydrologic function of all three springs would continue to be compromised. The springs would continue to experience invasive plant species infestations and altered hydrologic conditions. The springs would continue to provide foraging, cover, and nesting habitat for migratory birds; however, the vegetation community would not be improved through restoration.

### **5.7 4.7 Noxious Weeds / Invasive Non-native Species**

#### **5.7.1 4.7.1 Proposed Action**

The proposed action would result in removal of noxious weeds/invasive non-native species. Species to be removed include giant reed, saltcedar, and Bermuda grass, among others. Ground-disturbing restoration activities could potentially increase invasive species distribution and abundance in the project areas. Disturbed areas would be replanted with native species and treated for invasive species.

The proposed action would result in beneficial impacts, including re-establishment and/or improvement of habitat for springsnails, increase in native plant diversity, and reduction of invasive species presence in and surrounding the springs.

The one-year maintenance program under the proposed action would ensure the success of the restoration planting and allow native plants to establish and become self-sustaining. Invasive non-native species would be controlled according to the methodologies described in the restoration plan (see Appendix B). Herbicides and other treatment methods outlined in the restoration plan would be used to control invasive species to promote native species restoration.

##### **5.7.1.1 Cumulative Impacts**

The cumulative effects study area for noxious weeds/invasive non-native species is the Spring Mountains area (see Figure 1-1). Existing conditions for noxious weeds/invasive non-native



species are described in Section 3.7. Past, present, and reasonably foreseeable future activities that could affect noxious weeds/invasive non-native species include recreational activities (including OHV use) livestock grazing, wild burro use, and water development. Restoration activities under the proposed action would result in surface disturbance that has the potential to create conditions favorable for the establishment and invasion of noxious weeds and invasive non-native species. Environmental design and resource protection measures would reduce the potential for establishment and invasion of noxious weeds and invasive non-native species. These measures include seeding and planting with native species and invasive species treatment. The minor short-term potential impacts from implementing the proposed action, environmental design, and protection measures—in addition to the past, present, and reasonably foreseeable future actions within the cumulative area—would result in negligible impact from noxious weeds/invasive non-native species.

#### **5.7.2 4.7.2 No Action Alternative**

Under the No Action Alternative, current conditions would continue, and restoration of La Madre, Rainbow, and Kiup springs would not occur. Restoration with native plant species would not occur. The hydrologic function of all three springs would continue to be compromised. The springs would continue to experience invasive plant species infestations. Moreover, non-native invasive plants may spread and further degrade springsnail habitat.

### **5.8 4.8 Wilderness**

#### **5.8.1 4.8.1 Proposed Action**

The proposed action would result in adverse and beneficial impacts to wilderness character from activities within La Madre Spring (La Madre Mountain Wilderness) and Rainbow Spring (Rainbow Mountain Wilderness). Kiup Spring is not in wilderness, thus there would be no wilderness impacts under the proposed action.

##### **5.8.1.1 4.8.1.1 La Madre Spring**

Impacts to wilderness character at La Madre Spring from the proposed action would include the following:

- *Untrammeled* – The removal and maintenance of vegetation, use of straw wattles, and installation of native plants are a manipulation of the components and processes inside the wilderness and therefore an adverse impact to this quality. The process of removing the dam could constitute a temporary trammeling within wilderness (e.g., use of sediment controls); however, the removal of the dam would help return the spring to an untrammeled state, which would be a beneficial impact.
- *Undeveloped* – The removal of the dam would help return the spring to an undeveloped state, which would be a beneficial impact. Temporary use of protective plant cages and straw wattles would be a minor temporary adverse impact.
- *Natural* – The removal of vegetation may cause a short-term and temporary adverse impact to the spring's apparent naturalness. Removing non-native invasive plants and restoring the

spring vegetation with native plants would result in a long-term benefit to the apparent naturalness by improving native plant diversity. Removing the dam would create a positive long-term impact by restoring natural hydrologic conditions and improving habitat for sensitive wildlife species, help restore the spring's natural function, and help restore or enhance habitat for the springsnail.

- *Solitude or Primitive and Unconfined Recreation* – There may be a short-term and temporary adverse impact to the characteristic of solitude, should a visitor seeking solitude encounter the field crew at the spring and during subsequent re-treatments and monitoring. As mitigation, work would be scheduled during weekdays, when visitation is low, and the public would be notified of restoration activities in advance. Monitoring for such a short time has essentially no effect on visitor recreation. There would be no effect on primitive and unconfined recreation from any of the component activities from the proposed action.
- *Other Features of Value* – Removal of the dam and vegetation, in addition to replanting with native plants, would in a beneficial impact of restoring unique native plant communities and spring area habitat features.
- *Maintaining Traditional Skills* – Use of hand tools and pack animals would help maintain proficiency in use of primitive and traditional skills, non-motorized tools, and non-mechanical travel methods, which would be a beneficial impact.

#### 5.8.1.2 4.8.1.2 *Rainbow Spring*

Impacts to wilderness character at Rainbow Spring from the proposed action would include the following:

- *Untrammeled* – The removal and maintenance of vegetation and use of straw wattles, excavation of shallow pools, and installation of native plants is a manipulation of the components and processes inside the wilderness and therefore is an adverse impact to this quality.
- *Undeveloped* – Use of a gas-powered brush cutter, straw wattles, and geotextiles would have an adverse impact.
- *Natural* – The removal of vegetation and use of straw wattles and geotextiles may cause a short-term and temporary adverse impact to the spring's apparent naturalness. Excavating shallow pools and planting native plants would create a long-term beneficial impact to the spring's apparent naturalness, help restore the spring's natural function, and help restore or enhance habitat for the springsnail and overall quality at Rainbow Spring by improving native plant diversity.
- *Solitude or Primitive and Unconfined Recreation* – There may be a short-term and temporary adverse impact to the characteristic of solitude should a visitor seeking solitude encounter the field crew at the spring or hear the gas-powered brush cutters. Mitigation work would be scheduled during weekdays, when visitation is low, and the public would be notified of restoration activities in advance. Maintenance and monitoring would occur for a relatively short time and would have essentially no impact on visitor recreation. There would be no

impact on primitive and unconfined recreation from any of the component activities from the proposed action.

- *Other Features* – Removal of the vegetation, in addition to replanting with native plants and excavating shallow pools, would help restore the natural ecological function of the spring and would have a beneficial impact to the unique plant communities (spring area and habitat features). The area would improve as a self-regulating system with the greatest level of native life support.
- *Maintaining Traditional Skills* – Use of hand tools would help maintain traditional skills, which would be a beneficial impact. Traditional skills would be eroded by use of gas-powered brush cutters, which would be an adverse impact.

### 5.8.1.3 Cumulative Impacts

The cumulative effects study area for wilderness is the Spring Mountains area (see Figure 1-1). Existing conditions for wilderness are described in Section 3.8. Reasonably foreseeable future actions, including the proposed spring restoration, would result in temporary impacts to La Madre and Rainbow springs, both of which are within designated wilderness. Past, present, and reasonably foreseeable future actions include recreation activities (including OHV use), livestock grazing, wild burro use, noxious weed/invasive species infestations, and water development. Based on the Minimum Restoration Design, minimal tools would be used for restoration activities to reduce impacts to wilderness character. Restoration activities under the proposed action would remove invasive plant species, remove the human-made dam at La Madre Spring, and improve the riparian/wetland condition in the long term, thereby reducing the effect of cumulative impacts to wilderness in the long term. The minor short-term potential impacts from implementing the proposed action, environmental design, and protection measures—in addition to the past, present, and reasonably foreseeable future actions within the cumulative area—would result in minor impact to wilderness.

### 5.8.2 4.8.2 No Action Alternative

Under the No Action Alternative, current conditions would continue, and restoration of La Madre, Rainbow, and Kiup springs would not occur. Restoration with native plant species would not occur. Kiup Spring is not in wilderness, thus there would be no wilderness impacts under the No Action Alternative.

#### 5.8.2.1 4.8.2.1 La Madre Spring

Under the No Action Alternative, wilderness impacts for La Madre Spring would include the following:

- *Untrammeled* – The pre-existing trammeling of the spring would continue and therefore no change to this quality would occur.
- *Undeveloped* – By not removing the dam, the spring would retain its developed appearance, and therefore no change to this quality would occur.
- *Natural* – Keeping the dam would have an adverse impact on the spring's naturalness and natural function. The spring's apparent naturalness and natural function would be adversely

impacted by not removing invasive non-native vegetation and replanting with native vegetation. Abundance, distribution, or number of indigenous species would continue to adversely impact the health of plant and animal species and communities within wilderness. The presence of non-native invasive plants would continue to interfere with the natural conditions of La Madre Spring. Moreover, non-native invasive plants may spread and further degrade habitat for the BLM sensitive springsnail.

- *Solitude or Primitive and Unconfined Recreation* – This alternative would not affect solitude or primitive and unconfined recreation.
- *Other Features* – Not removing the dam, not removing invasive non-native vegetation, and not planting native species would continue to have an adverse impact on the natural ecological function of the spring. The area would continue to be impaired as a self-regulating system with the greatest level of native life support.
- *Maintaining Traditional Skills* – No work would occur, therefore traditional skills would not be impacted.

#### 5.8.2.2 4.8.2.2 *Rainbow Spring*

Under the No Action Alternative, wilderness impacts for Rainbow Spring would include the following:

- *Untrammelled* – The spring would retain its untrammelled character under this alternative, because no work would occur.
- *Undeveloped* – The spring would retain its undeveloped appearance under this alternative, because no work would occur.
- *Natural* – The spring's apparent naturalness and natural function would be adversely impacted by not removing invasive non-native species and a nearmonoculture of herbaceous plants and replanting them with native woody vegetation. Abundance, distribution, or number of indigenous species would continue to adversely impact the health of plant and animal species and communities within wilderness. The low species diversity would continue to interfere with the natural conditions of Rainbow Spring. Moreover, non-native invasive plants may spread and further degrade habitat for the BLM sensitive springsnail.
- *Solitude or Primitive and Unconfined Recreation* – This alternative would not affect solitude or primitive and unconfined recreation because no work would occur.
- *Other Features* – Not removing invasive non-native vegetation, and not planting diverse native woody species would have an adverse impact on the natural ecological function of the spring and the unique plant communities (spring area and habitat features). The area would continue to be impaired as a self-regulating system with the greatest level of native life support.
- *Maintaining Traditional Skills* – No work would occur, therefore traditional skills would not be impacted.

## **5.9 4.9 Visual Resources**

### **5.9.1 4.9.1 Proposed Action**

The proposed action would result in adverse impacts to visual resources. Impacts for each spring are presented below.

#### **5.9.1.1 4.9.1.1 *La Madre Spring***

The proposed action activities at La Madre Spring meet the objectives for the designated VRM Class I. The existing character of the landscape would be preserved. Proposed activities may result in very minor short-term and small-scale visual impacts that would dissipate as native vegetation is allowed to re-establish. The level of change to the characteristic landscape of La Madre Spring would be very low and once restoration is complete would not attract attention. The resulting restored area would simulate the forms, lines, colors, and textures found in the surrounding undisturbed areas.

#### **5.9.1.2 4.9.1.2 *Rainbow Spring***

The proposed action activities at Rainbow Spring meet the objectives for the designated VRM Class I. The existing character of the landscape would be preserved. Proposed activities may result in very minor short-term and small-scale visual impacts that would dissipate as native vegetation is allowed to re-establish. The level of change to the characteristic landscape of Rainbow Spring would be very low and once restoration is complete would not attract attention. The resulting restored area would simulate the forms, lines, colors, and textures found in the surrounding undisturbed areas.

#### **5.9.1.3 4.9.1.3 *Kiup Spring***

The proposed action activities at Kiup Spring meet the objectives for the designated VRM Class III. Proposed activities may result in very minor short-term visual impacts that would dissipate as native vegetation is allowed to re-establish. The level of change to the characteristic landscape of Kiup Spring would be minimal once restoration is complete. The intent of the proposed action would be to improve the visual quality and simulate the forms, lines, colors, and textures found in the surrounding undisturbed areas.

#### **5.9.1.4 *Cumulative Impacts***

The cumulative effects study area for visual resources is each spring and surrounding area (see Figure 1-1). Existing conditions for visual resources are described in Section 3.9. Reasonably foreseeable future actions, including the proposed spring restoration, would result in temporary impacts to visual resources at each spring. Past, present, and reasonably foreseeable future actions include recreation activities (including OHV use) livestock grazing, wild burro use, noxious weed/invasive species infestations, and water development. Restoration activities under the proposed action would remove invasive plant species, remove the human-made dam at La Madre Spring, and improve the riparian/wetland condition in the long term, thereby reducing the effect of cumulative impacts to visual resources in the long term. The minor short-term impacts from implementing the proposed action, environmental design, and protection

measures—in addition to the past, present, and reasonably foreseeable future actions within the cumulative area—would result in minor impact to visual resources.

#### **5.9.2 4.9.2 No Action Alternative**

Under the No Action Alternative, current conditions would continue, and restoration of La Madre, Rainbow, and Kiup springs would not occur. The dam at La Madre Spring would remain intact. The visual character of the springs would not be altered. Presence of invasive native and non-native species, as well as the dam at La Madre Spring, would continue to contrast with surrounding undisturbed areas.

### **5.10 4.10 Human Health and Safety**

#### **5.10.1 4.10.1 Proposed Action**

The proposed action may result in impacts to human health and safety. The proposed action would entail standard risks involved in hiking, herbicide application, and tool use, which would be mitigated by personnel training and safety requirements. Visitors would be allowed in the area during project implementation. Work would be scheduled during weekdays, when visitation is low, and the public would be notified of restoration activities in advance. Any adverse impacts on visitors would be minimized by making the areas and times of work known at the Visitor Center, along the access roads to the work sites, or on the internet.

##### **5.10.1.1 Cumulative Impacts**

The cumulative effects study area for human health and safety is each spring and surrounding area (see Figure 1-1). Existing conditions for human health and safety are described in Section 3.10. Past, present, and reasonably foreseeable future actions include recreation activities (including OHV use), restoration activities, and water development. Restoration activities under the proposed action would remove invasive plant species and remove the human-made dam at La Madre Spring. The minor short-term impacts from implementing the proposed action, environmental design, and protection measures—in addition to the past, present, and reasonably foreseeable future actions within the cumulative area—would result in minor impact to human health and safety.

#### **5.10.2 4.10.2 No Action Alternative**

Under the No Action Alternative, current conditions would continue and restoration of La Madre, Rainbow, and Kiup springs would not occur. The dam at La Madre Spring would remain intact. Because no restoration work would occur, worker and visitor safety would not be affected.

## **6 5.0 List of Preparers**

This section identifies the individuals that were responsible for the preparation of this EA.

**TABLE 5-1  
LIST OF PREPARERS – RECON ENVIRONMENTAL, INC.**

Name	Title	Responsible for the Following Section(s) of this Document
Carianne Campbell Helen Cordier	Biologist/Vegetation Ecologist Environmental Coordinator	Project Description – Restoration Plan Soils, Migratory Birds, Noxious Weeds/Invasive Non-native Species, Fish and Wildlife
Susy Morales	Senior Environmental Planner/Wildlife Biologist	Visual Resources
Sharon Wright-Harris	Writer/Editor	Riparian/Wetlands, Wilderness, Hydrology, Water Resources/Quality

**TABLE 5-2  
INTERNAL REVIEWERS – BLM SOUTHERN NEVADA DISTRICT OFFICE RESOURCE SPECIALISTS**

Name	Resource / Specialty
Fred Edwards	
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## 7 6.0

### Acronyms

BLM	Bureau of Land Management
CFR	Code of Federal Regulations
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
OHV	Off-highway vehicle
RMP	Resource Management Plan
USDA	United States Department of Agriculture
VRM	Visual Resource Management



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## **APPENDICES**

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## **APPENDIX A**

### **Scoping Report**

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## **APPENDIX B**

### **Restoration Plan**



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## **APPENDIX C**

### **Visual Contrast Rating Forms and Photographs**

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